10.   (ADDED) An adaptive filter comprising:

a plurality of stages, at least one stage comprising an adaptive analysis portion;

at least one adaptive analysis portion of at least one stage comprising:

> a correlation direction vector device operative to form a correlation direction vector between a set of input vectors and a set of input scalars, each input set discretely characterized on the same index;
>
> an inner product device operative to form a set of inner products of each input vector and the correlation direction vector;
>
> a vector scaling device operative to form a set of scaled direction vectors from each inner product and the correlation direction vector; and
>
> a vector difference device operative to form a set of vector differences between corresponding elements of the set of input vectors and the set of scaled direction vectors.

11.   (ADDED) The adaptive filter of claim 10, wherein at least one stage comprising an analysis portion further comprises a synthesis portion;

at least one synthesis portion of at least one stage comprising an analysis portion comprising:

> a mean square error device operative to form an average magnitude squared error from an error signal of the next higher stage;
>
> a weight calculation device operative to form a weight as a function of the correlation vector length of the corresponding analysis portion and the average magnitude squared error;
>
> an error scaling device operative to form a scaled error as a product of the error signal of the next higher stage and the weight; and
>
> an error difference device operative to form a error signal of the current stage as the difference between the set of input scalars and the scaled error.

12.   (ADDED) A method for filtering a signal characterized by discrete data, the data characterized by at least one set of input vectors and at least one set of input scalars, the method comprising:

in at least one adpative analysis portion in at least one of a pluraity of stages:

forming a correlation direction vector between the set of input vectors and the set of input scalars, each input set discretely characterized on the same index;

forming a set of inner products of each input vector and the correlation direction vector;

forming a set of scaled direction vectors from each inner product and the correlation direction vector; and

forming a set of vector differences between corresponding elements of the set of input vectors and the set of scaled direction vectors.

13.   (ADDED) The method of claim 12, further comprising:

in at least one synthesis portion of at least one stage comprising an analysis portion,

forming an average magnitude squared error from an error signal of the next higher stage;

forming a weight as a function of the correlation vector length of the corresponding analysis portion and the average magnitude squared error;

forming a scaled error as a product of the error signal of the next higher stage and the weight; and

forming a error signal of the current stage as the difference between the set of input scalars and the scaled error.